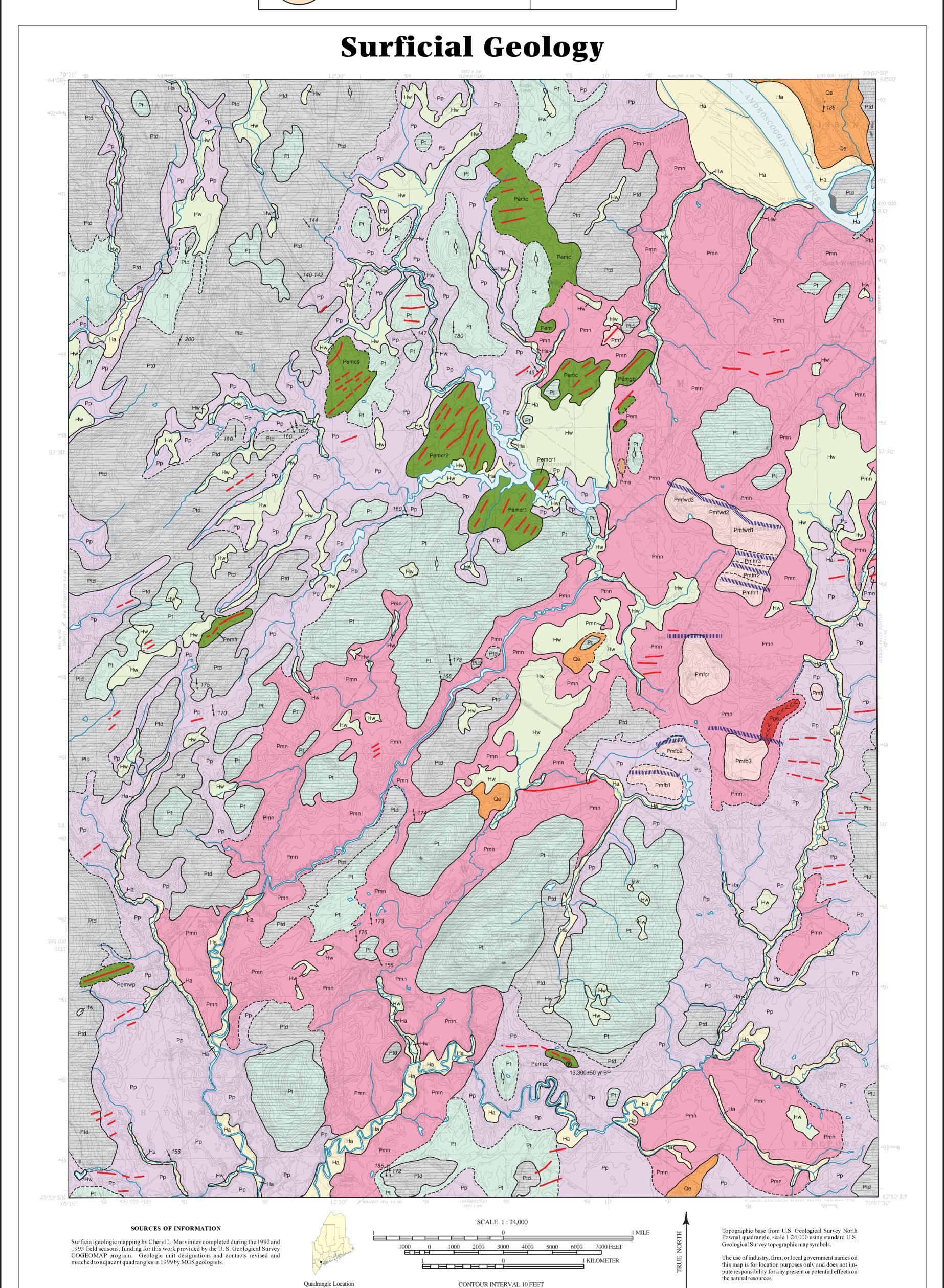
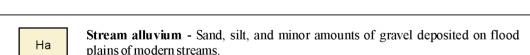
North Pownal Quadrangle, Maine Surficial geologic mapping by Cheryl L. Marvinney **Robert G. Marvinney** Digital cartography by: Cartographic design and editing by: **Robert A. Johnston Robert D. Tucker** State Geologist Funding for the preparation of this map was provided in part by the U.S. Geological Survey Cooperative Geological Mapping (COGEOMAP) Program, Cooperative Agreement No. 1434-92-A-1071. Open-File No. 99-93 **Maine Geological Survey** 1999 Address: 22 State House Station, Augusta, Maine 04333 Telephone: 207-287-2801 E-mail: mgs@maine.gov For additional information, **Home page:** http://www.maine.gov/doc/nrimc/nrimc.htm see Open-File Report 99-124.





Freshwater wetlands - Muck, peat, silt, and sand. Poorly drained areas, often with Hw

Eolian deposits - Well-sorted fine sand deposited by wind.

Marine nearshore deposits - Pleistocene silty to gravelly sand deposited as a result of wave activity in nearshore or shallow-marine environments; not associated with beach morphology. Marine shoreline deposits - Predominantly sand and gravel. Consists of beach

deposits formed during regressive phase of marine submergence. **Presumpscot Formation** - Massive to laminated silty clays, which overlie bedrock Рр and till and locally are interbedded with and overlie end moraines and marine fan deposits. Includes sand deposited as a distal unit of submarine fans. Unit contains

fossil shells in a few exposures. End moraines - Linear ridges with exposures indicating stratified sand and gravel, locally interbedded with Presumpscot Formation silty clays and/or till.

> Pemgb - Gerrish Brook end moraine Pempc - Pownal Center end moraine

End moraines based on morphology, surface augering and/or limited

Pemwp - West Pownal end moraine Pemfr - Fickett Road end moraine

End moraine complexes - Clusters of smaller, steep-sided linear ridges consisting of dense sandy-matrix diamicton.

 $Pemcr_{1,2}$ - Runaround Pond moraine clusters 1 and 2. - Stackpole Pond moraine complex.

Submarine outwash fans - Thick sand and gravel accumulations formed at the Pmf mouths of subglacial tunnels located at Pleistocene ice margins. The sand and gravel is interbedded with and overlain by Presumpscot Formation clays at the distal edges of the fans. Each fan, or group of fans, has been assigned a unique

> $Pmfb_{1-3}$ - Blackstone fans Pmfcr - Cushing Road fan Pmfwd₁₋₃ - West Durham fans

geographic name, listed below:

 $Pmfrr_{1-3}$ - Rabbit Run fans

The correlations of these marine fan deposits and the end moraines are described in

Esker - Gravel and sand deposited in an ice tunnel by a subglacial meltwater stream. Chevrons point in the direction of meltwater flow.

Till - Gravelly to bouldery, sandy-matrix diamicton.

outcrops may be common.

Thin drift areas, undifferentiated - Areas with less than ten feet of drift covering bedrock. Till overlies bedrock on hillslopes and ridge crests; Presumpscot Formation silty clays are present in depressions; and nearshore deposits locally

Thin till deposits - Areas where till is generally less than 10 ft thick and bedrock

overlie till, Presumpscot Formation, and bedrock on hillslopes and at the base of Bedrock exposure - Small rock outcrops, and areas of numerous small outcrops

are shown as gray areas. Striation - Glacial striation locality. Dot marks point of observation. Number

indicates azimuth of ice-flow direction.

End moraine - End moraine crests. Dashed where inferred.

Drumlin - Glacially streamlined hill.

Ice marginal position - Mapped and inferred ice marginal positions.

Marine fossil locality - Site where fossil shells have been collected and dated (Weddle, T. K. and Retelle, M. J., 1995; see Marvinney, 1999). Label indicates radiocarbon age estimate.

Scarps - Scarp resulting from stream erosion. Hachures on downslope side.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to

human activity, such as fill or other land-modifying features. The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar

changes for long-term planning efforts, such as coastal development or waste disposal. Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

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- 2. Marvinney, C. L., 1999, Surficial materials of the North Pownal quadrangle, Maine: Maine

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- Maine: Maine Geological Survey, Open-File Map 99-25. 4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological
- Geological Survey, scale 1:500,000. 6. Weddle, T. K., and Retelle, M. J., 1995, Glaciomarine deposits of the late Wisconsinan Casco Bay Sublobe of the Laurentide Ice Sheet, in Hussey, A., M., II, and Johnston, R. A. (editors), Guidebook to field trips in southern Maine and adjacent New Hampshire: New England Intercollegiate Geological Conference, 87th annual meeting, Brunswick, Maine: p. 173-

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